TRANSGENIC PLANTS EXPRESSING ASSEMBLED SECRETORY ANTIBODIES

Description

CROSS REFERENCE TO RELATED APPLICATION

This is a continuation-in-part of copending U.S. application Serial No. 07/971,951, filed November 5, 1992, which is a continuation of USSN 07/591,823, filed October 2, 1990 (now U.S. Patent No. 5,202,422), which is a continuation-in-part of USSN 07/427,765, filed October 27, 1989 (abandoned), the disclosures of which are incorporated by reference herein.

TECHNICAL FIELD

The present invention relates to expression and assembly of foreign multimeric proteins -- e.g., antibodies -- in plants, as well as to transgenic plants that express such proteins.

BACKGROUND

It is known that polypeptides can be expressed in a wide variety of cellular hosts. A wide variety of structural genes have been isolated from mammals and viruses, joined to transcriptional and translational initiation and termination regulatory signals from a source other than the structural gene, and introduced into hosts into which these regulatory signals are functional.

For economic reasons, it would be desirable to utilize genetically engineered unicellular microorganisms to produce a wide variety of polypeptides. However, because of the inherent differences in the nature of unicellular organisms on one hand and mammalian cells on the other, the folding and processing of polypeptides in unicellular microorganisms appears to be quite different from the folding and processing that is effected in mammalian cells. As a result, mammalian polypeptides derived from unicellular microorganisms are not always properly folded or processed to provide the desired degree of biological or physiological activity in the obtained polypeptide.

To that end attempts have been made, with varying degrees of success, to express mammalian polypeptides in plants. One particularly important polypeptide is secretory immunoglobulin A.

Secretory immunoglobulin A (SIgA) is the most abundant form of immunoglobulin (Ig) in mucosal secretions, where it forms part of the first line of defense against infectious agents. The molecule exists mainly in the 11S dimeric form,